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Lists of Coleoptera, Lepidoptera, Diptera and Hemiptera Collected in Arizona by the Entomological Expeditions of the University of Kansas in 1902 and 1903. . . . . *F. H. Snow.*

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LISTS OF COLEOPTERA, LEPIDOPTERA, DIPTERA AND HEMIPTERA

COLLECTED IN ARIZONA BY THE ENTOMOLOGICAL EXPEDITIONS OF THE UNIVERSITY OF KANSAS IN 1902 AND 1903.

BY F. H. SNOW.

A combination of two papers, read at the thirty-fifth and thirty-sixth annual meetings of the Kansas Academy of Science, January 2, 1903, and November 27, 1903.

THE above-named expeditions made insect collections in four localities. First, near Thomas's ranch, in Oak Creek Canyon, about twenty miles south of Flagstaff, in Coconino county, at an altitude of 6000 feet, August 13 to 25, 1902; second, at "Windmill Spring," near Dilman's ranch, on the north side of Humphrey's peak, one of the San Francisco mountains, about fifteen miles north of Fagstaff, altitude 9500 feet, August 26 to September 4, 1902; third, Martinez, or Congress Junction, in Yavapai county, 125 miles south of Ash Fork, altitude 3000 feet, July 22 to August 1, 1903; fourth, near Tappan's ranch, on the Bill Williams' Fork of the Colorado river, which separates Mojave and Yuma counties, altitude 1000 feet, August 3 to September 3, 1903. The camps of 1902 were located in a typical mountain environment; those of 1903 were in the arid, sandy and hot desert region of southwest Arizona.

Oak Creek Canyon has precipitous walls from 1200 to 1500 feet high, and is a miniature edition of the Grand Canyon of the Colorado, but with an abundance of stately oaks and pines and beautiful wild flowers, and luxuriant farm crops on the two or three ranches on the narrow floor of the canon. Oak creek is a vigorous mountain stream of clear, cool water, and is well stocked with luscious trout. No wagons can enter this canon, and our baggage, camp equipment and provisions were packed on

horseback down a zigzag trail, the members of the party carr ing by hand all articles of a fragile character. A more deligh ful collecting region could not have been selected.

"From the second camp, at the base of the highest mounta peak of Arizona, two trips were made to the summit, but wi results of an unexpected character. It is a well-known fa that the insect fauna above timber-line in Colorado is of a ve different character from that of the region below timber-lin The writer had previously collected insects on Pike's pea Gray's peak, and Long's peak. Here we found the *Parnassi* butterflies, the White-mountain butterfly (*Chionobas semidea Colias meadii*, *Syngrapha hochenwarthi* and other species n found at the bases of these mountains. But at the summit Humphrey's peak, in Arizona, 12,800 feet above sea level, insects were found which did not also occur at the lower alt tudes. *Vanessa californica* and *Pieris occidentalis* were commo both at the base and summit, while the common lady-bi *Hippodamia lecontei*, and the false chinch-bug *Nysius californ cus*, were exceedingly abundant, both the latter species occu ring over the entire region of the plains and mountains west the Missouri river. The most probable explanation of th notable difference in the high-altitude fauna of Colorado a Arizona appears to be that the glacial ice mass did not exte so far south as the San Francisco mountains, and thus pr vented the northern species from a more southern extension.'

At the third camp, where we left the Ash Fork and Phœn railroad, about three miles from the famous Congress mine, t insect fauna was conspicuously different from that of the mou tain camps of 1902. Almost every species was new to our e perience as collectors. We were impressed with the profusi of insect life in an environment apparently so unfavorable. the little town of Martinez every drop of water used by the i habitants for all purposes is brought by rail from Date cree sixteen miles to the north. The maximum temperature ea day did not fall below 104 degrees (F.) and on one day ro to 116 degrees.

On the 1st day of August, 1903, we proceeded by wagon alo

* This paragraph within quotation marks was read before "Section F," at the fifty-th annual meeting of the American Association for the Advancement of Science, at St. Lou December 29, 1903.

he dry bed of Date creek and across the Cactus Plain to our ourth camp, which was located fifty miles west of Martinez nd about three miles from Tappan's ranch, ten miles south of Artillery peak, on the left bank of the Bill Williams Fork, at a distance of about twenty-five or thirty miles from the junction of that stream with the Colorado river. Our tents were pitched near a lone cottonwood tree on the bank of the stream about half a mile from its entrance into the so-called "box canyon." There were two or three Mexican ranches within a mile of the camp, where we obtained an abundant supply of the most delicious muskmelons, and where the luxuriant alfalfa fields attracted a profusion of insects of all orders. At night we "sugared" for moths on the trunk of our cottonwood tree, securing large numbers of individuals, but a small number of species, of Noctuids. The three or four species of Mesquite furnished a considerable variety of coleopterous species, especially of the family Buprestidæ. The so-called "poly verde" was notably rich in desirable species.

My associates in the Arizona expedition of 1902 were Dr. Chas. F. Adams, Roy L. Moodie, and my son Frank L. Snow; in 1903 they were Doctor Adams, Geo. C. Mackenzie, and Eugene Smyth, and the success of the expeditions was largely due to the energy with which these fellow students devoted their attention to the work in hand.

I. LIST OF COLEOPTERA.

For the identification of species not readily determinable from the University collection, the writer is under obligations to Mr. Charles Liebeck and Mr. H. C. Fall.

Henshaw's numbers are used. Abbreviations for localities: O. for Oak Creek canon; H. for Humphrey's Peak at base; M. for Martinez (Congress Junction), and B. for Bill Williams Fork.

Family Cicindelidæ.

12. Tetracha carolina Linn. B.
20. Cicindela nigrocærulea Lec., var. M.
40. punctulata Fab. O.
57. lemniscata Lec. O. M.

Family Carabidæ.

73. Omophron obliteratum Horn. O. B.
..... Cychrus van dykei Roetschke. O.
..... n. sp. H.

119. Carabus tædatus Fab. O. H.
140. Calosoma simplex Lec. O. B.
221. Dyschirius tridentatus Lec. B.
273. Clivina ferrea Lec. M.
283. Schizogenius lineolatus Say. B.
286. amphibius Hald. B.
..... n. sp. B.
309. Bembidium carinatum. B.
330. complanulum Mann. B.
343. transversale Dej. M. B.
345. lugubre Lec. O.
351. lucidum Lec. H.
367. nubiculosum Chd. B.
391. versicolor Lec. B.
408. dubitans Lec. O.
436. Tachys vorax Lec. B.
449. nanus Gyll. O. H.
467. audax Lec. B.
468. rapax Lec. M.
525. Pterostichus constrictus Say. O.
579. lustrans Lec. O.
647. Amara latior Kirby. H.
670. interstitialis Dej. O. H.
670. interstitialis Dej. green var. H.
751. Calathus dubius Lec. O. H.
756. Platynus dissectus Lec. H.
771. brunneomarginatus Mann. var. O.
831. ruficornis Lec. ? O.
842. Lachnophorus elegantulus Mann. B.
864. Ega lætula Lec. B.
882. Lebia viridis Say. H.
941. Cymindis planipennis Lec. H.
..... Brachynus sp. O. H. B.
1008. Chlænius leucoscelis Chev. H. B.
1010. obsoletus Lec. B.
1034. Anomoglossus emarginatus Say. O.
1047. Oodes elegans Lec. B.
1080. Harpalus retractus Lec. O.
1081. amputatus Say. O. H.
1087. pennsylvanicus De G. O. H. B.
1094. herbivagus Say. H.
1099. ellipsis Lec. H.
1109. fraternus Lec. ? H.
1110. funestus Lec. H.
1111. oblitus Lec. H.
..... n. sp. H.
1125. Selenophorus pedicularius Dej. M.
1125. semiopacus, var. O.
1144. Stenolophus flavipes Lec. B.
1158. Bradycellus rupestris Say. B.
1184. Anisodactylus consobrinus Lec. H.
1214. Pseudomorpha angustata Horn. M.

Family HALIPLIDÆ.

1229. Cnemidotus simplex Lec. B.

Family DYTISCIDÆ.

1243. Laccophilus decipiens Lec. M. B.
1251. mexicanus Aube. B.
..... Hydroporus undet. sp., near addendus Cr. B.
1389. Ilybius biguttalus Germ. O.
1396. Coptotomus interrogatus Fab. B.
1476. Eretes sticticus Linn. M.
1496*b*. Thermonectes latecinctus Lec. B.

Family HYDROPHILIDÆ.

1546. Helophorus linearis Lec. M.
1586. Hydrophilus triangularis Say. M.
1588. Tropisternus limbalis Lec. B.
1594. ellipticus Lec. M. B.
1600. Berosus punctatissimus Lec. B.
1602. miles Lec. B.
1619. Chætarthria pallida Lec. B.
1621. Laccobius agilis Rand. B.
1622. ellipticus Lec. M.
1624. Helochares carinatus Lec. B.
1626. nebulosus Say. B.
1634. diffusus Lec. B.

Family SILPHIDÆ.

1698. Necrophorus marginatus Fab. H.
1700. guttula Mots. H.
1705. Silpha truncata Say. H.
1706. lapponica Hbst. H.

Family STAPHYLINIDÆ.

..... Aleochara undet. sp. B.
2098. Quedius explanatus Lec. O.
2119. Creophilus villosus Grav. O.
2123. Staphylinus nigrellus Horn. O.
2178. Philonthus varians Payk. H.
undet. sp. B.
2251. Actobius pæderoides Lec. B.
2778. Apocellus analis Lec. ? B.

Family PHALACRIDÆ.

2992. Phalacrus penicillatus Say. O. H.
9874. conjunctus Casey. B.
2998. Olibrus striatulus Lec. O.
3002. pallipes Say. O. H.
..... Eustilbus sp., near nanulus Casey. B.

Family COCCINELLIDÆ.

3041. Hippodamia 5-signata Kirby. H.
3043. lecontei Muls. H., summit and base.
3046. convergens Guer. H. B.
3051. parenthesis Say. O.
3064. Cycloneda sanguinea Linn. O. H.
3065*a*. Olla abdominalis Say. B.
..... Adalia humeralis Say., var. O.
3069. Cleis picta Rand. O.
..... Anatis lecontei Casey. O. H.
3078. Psyllobora 20-maculata Say. O.
3078*a*. tædata Lec. O. B.
3101. Hyperaspis fimbriolata Melsh. B.
3103. tæniata Lec. B.
3105. undulata Say. B.
3111. osculans Lec. B.
3142. Scymnus cinctus Lec. B.
3146. hæmorrhous Lec. O. B.
3157. lacustris Lec. O.
..... ardelis Horn. B.
..... undet. sp. B.

Family EROTYLIDÆ.

3240. Erotylus boisduvali Chev. O.

Family DERMESTIDÆ.

3418. Dermestes marmoratus Say. O. H.
3423. carnivorus Fab. B.
3440. Trogoderma simplex Jayne. B.
..... undet. sp. B.
3450. Cryptorhopalum apicale Mann. H. B.
3455. Orphilus glabratus Fab. H.

Family HISTERIDÆ.

3494. Hister depurator Say. H.
3539. Epierus nasutus Horn. O.
3582. Saprinus alienus Lec. B.
3583. lugens Er. H. B.
3586. oregonensis Lec. O. H.
3607. vitiosus Lec. M.
3610. fimbriatus Lec. H. B.
3612. cærulescens Lec. B.

Family NITIDULIDÆ.

3733. Perthalycra murrayi Horn. O.

Family TROGOSITIDÆ.

3832. Alindria teres Melsh. B.
3835. Trogosita yuccæ Cr. B.
3838. Tenebrioides corticalis Melsh. O.
3841*a*. californica Horn. B.
3850. Calitys scabra Thunb. O.

Family BYRRHIDÆ.

3903. Limnichus analis Lec. B.

Family PARNIDÆ.

3920. Dryops productus Lec. O. B.
3924. suturalis Lec. B.

Family HETEROCERIDÆ.

3965. Heterocerus collaris Kies. B.

Family ELATERIDÆ.

4089. Chalcolepidius webbii Lec. B.
10035. behrensi Cand. M. B.
4128. Horistonotus simplex Lec. M.
4136. Esthesopus parcus Horn. M.
4137. dispersus Horn. M.
..... two undet. sp. B.
10052. Cryptohypnus cucullatus Horn. B.
4185. Monocrepidius vespertinus Fab. B.
4188. sordidus Lec. M.
4277. Ludius hepaticus Germ. B.
4306. Melanotus macer Lec. M.
4402. Athous scissus Lec. O.
..... Corymbites undet. sp. M.
4530. Euthysanius lautus Lec. O.

Family BUPRESTIDÆ.

4560. Gyascutus planicosta Lec. M. B.
4561. obliteratus Lec. M. B.
4564. Hippomelas sphenicus Lec. M.
4565. cælatus Lec. M. B.
4594. Poecilonota cyanipes Say. O.
4620. Melanophila atropurpurea Say. M. B.
4636. Chrysobothris octocola Lec. M. B.
4637. atabalipa Lap. M, (=*basalis*).
4639. femorata Fab., var. B.
4650. trinervia Kirby. O.
4653. debilis Lec. M. B.
4654. deleta Lec. M.
10078. mali Horn. O. M.
10085. merkelii Horn. M.
..... nearly related to mexicana, if not that species. O.
4667. Actenodes calcarata Chev. B.
4675. Polycesta velasco Lap. and Gory. M. B.
4677. Acmæodera amplicollis Lec. O.
4679. amabilis Horn. O.
4686. miliaris Horn. O. B.
4690. connexa Lec. O.
..... aliciæ Fall. B.
4705. guttifera Lec. B.

4708. Acmæodera 4-vittata Horn. O. M.
4710. gibbula Lec. M.
10100. stigmata Horn. B.
10101. bivulnera Horn. B.
..... New genus, n. sp. B.
..... Tyndaris n. sp. B.
4752. Agrilus couesii Lec. O.
10126. blandus Horn. O.
..... Taphrocerus sp. O.
4764. Pachyscelus purpureus Say. O.

Family LAMPYRIDÆ.

4767. Rhyncheros sanguinipennis Say. O.
4772. Lycostomus loripes Chev. O.
4811. Lucidota punctata Lec. O.
4815. Ellychnia corrusca Linn. O.
4817. Pyropyga fenestralis Melsh. B.
4872. Chauliognathus scutellaris Lec., var. O.
4970. Ditemnus obtusus Lec.? B.

Family MALACHIDÆ.

5002. Collops bipunctatus Say. O. H.
5004. 4-maculatus Fab., var. O.
5006. pulchellus Horn. B.
5010. laticollis Horn. O.
5023. Malachius biguttulus Horn. M.
5040. Anthocomus ventralis Horn. O.
..... undet. sp. B.
5055. Attalus morulus Lec. O.
5061. rufiventris Horn. B.
..... n. sp. B.
..... undet. sp., near trimaculatus Mots. B.
5109. Listrus senilis Lec. O. H.
Five undetermined species. O.

Family CLERIDÆ.

5131. Cymatodera puncticollis Bland. M.
5134. cylindricollis Chev. O.
5151. ovipennis Lec. M.
..... n. sp. O.
..... undet. sp. M.
5156. Trogodendron edwardsii Horn. B.
5158. Trichodes ornatus Say. O. H.
5173. Clerus abruptus Lec. O.
5192. Hydnocera subænea Spin. O.
5197. discoidea Lec. B.
..... n. sp. O.
5223. Enoplium humerale Horn. O.
5230. Necrobia rufipes Fab. B.
5232. violaceus Linn. H.

Family PTINIDÆ.

5338. Sinoxylon simplex Horn. M. B.
5340. sericans Lec. M.
5354. Amphicerus fortis Lec. M. B.

Family LUCANIDÆ.

5419. Platycerus depressus Lec. H.

Family SCARABÆIDÆ.

5442. Chœridium lecontei Harold. B.
5494. Atænius lobatus Horn. B.
5497. hirsutus Horn. M.
5502. desertus Horn. M.
..... haroldi Steinbeil. M. B.
10186. læviventris Horn. M.
5529. Aphodius vittatus Say. H.
5533. lividus Oliv. M.
5539. anthracinus Lec. O. H.
5556. subtruncatus Lec. H.
5581. Ochodæus biarmatus Lec. M.
5612. Trox scutellaris Say. M.
5616. suberosus Fab. M.
5617. punctatus Germ. B.
5618. tuberculatus De G. O.
5620. sonoræ Lec. O. H. M.
5633. Glaresis mendica Horn. M.
5692. Macrodactylus uniformis Horn. O.
5697. Orsonyx anxius Lec. B.
5701. Diplotaxis popino Casey. M.
5706. tristis Kirby. M.
5721. carbonata Lec. M.
5724. punctata Lec. M.
..... four undet. sp. M.
5806. Listrochelus disparilis Horn. O.
5809. scoparius Lec. M.
5816. timidus Horn. M.
5822. Polyphylla decemlineata Say. O.
5842. Strigoderma arboricola Fab. O.
5846. Pelidnota lugubris Lec. M.
5859. Cyclocephala longula Lec. M.
5865. dimidiata Burm. M. B.
5866. manca Lec. O.
5870. Ligyrus ruginasus Lec. M.
10276. Aphonides dunniana Rivers. M.
5883. Strategus julianus Burm. M.
5908. Euphoria fascifera Lec. M.
5911. inda Linn. O.

Family SPONDYLIDÆ.

5947. Parandra polita Say. B.

Family CERAMBYCIDÆ.

5952. Mallodon mandibularis Harold. O.
5957. Derobrachus geminatus Lec. M. B.
..... undet. sp. near Axestinus. M.
6036. Osmidus guttatus Lec. B.
6049. Romaleum simplicicolle Hald. M.
6067. Elaphidion tenue Lec. M.
6076. Aneflus protensus Lec. M.
6105. Rhopalophora longipes Say. O.
6113. Rosalia funebris Mots. O.
6119. Dendrobias quadrimaculatus Dup. M.
6122. Stenaspis solitaria Say. M.
6126. Tragidion annulatum Lec. O.
6127*a*. fulvipenne Say. O.
6135. Aethecerus latecinctus Horn. B.
6158. Sphænothecus suturalis Lec. B.
6166. Stenosphenus debilis Horn. O.
6249. Pachyta armata Lec. O.
6490. Mecas cana Newm. O.
6513*c*. Tetraopes oregonensis Lec. O.
Two undetermined species of uncertain genera. M. B.

Family CHRYSOMELIDÆ.

6574. Lema nigrovittata Guer. B.
6582. Euryscopa lecontei Cr. M. B.
..... parvula Jac. M. B.
6584. Coscinoptera æneipennis Lec. M.
6588. canella Lec. B.
6589. mucorea Lec. M.
6594. Megalostomis major Cr. M.
6596*b*. Babia tetraspilota Lec. O.
6599. Saxinis saucia Lec. O. B.
10346. sonorensis Jac. O.
6600. Urodera crucifera Lec. O.
6601. Chlamys plicata Fab. B.
6622. Cryptocephalus leucomelas Suffr. O.
..... n. sp. O.
6653. Pachybrachys xanti Cr. M. B.
6660. abdominalis Say. B.
6690. atomarius Melsh. O.
..... thoracicus Jac. B.
..... two n. sp. B.
6706. Monachus guerini Perb. B.
6707. Diachus auratus Fab. O.
6754. Metachroma californica Cr. B.
6796. Chrysomela conjuncta Rog. O.
6800. disrupta Rog. O.
6821. auripennis Say. O.
6881*a*. Diabrotica tenella Lec. O. B.
6916*a*. Monoxia angularis Lec. O.
6916. obtusa Lec., var. O.
10407. debilis Lec. B.

6929. Œdionychis lustrans Cr. M.
6933. lugens Lec. O.
6949. Disonycha 5-vittata Say. O.
10416 crenicollis Say. B.
7001. Systena tæniata Say., var. M.
7001 tæniata, var. mitis Lec. B.
7001. tæniata, var. pallidula Boh. B.
10438. Longitarsus vanus Horn. B.
10452. Glyptina atriventris Horn. B.
7028. Phyllotreta lewisii Cr. B.
10458. pusilla Horn.
10463. Chætocnema ectypa Horn. B.
7068. Microrhopala cyanea Say. O.
7073. Odontota collaris Say. O.
7074. omogera Cr. O.

Family Bruchidæ.

7133. Bruchus pruininus Horn. B.
7137. prosopis Lec. B.
7143. bisignatus Horn B.
7149. amicus Horn. B.

Family Tenebrionidæ.

7168. Edrotes ventricosus Lec. B.
7171. Triorophus lævis Lec. M.
7182. Eurymetopon rufipes Esch. B.
7183. emarginatum Casey. B.
7184. dubium Casey. M.
7185. convexicolle Lec. M.
7189. serratum Lec. B.
..... undet. sp. M.
7191. Emmenastus longulus Lec. M. B.
7193. subopacus Horn. M.
7195. ater Lec. O. H.
7196. acutus Lec. O.
..... convexus Lec., var. O. H.
7302. Epitragus canaliculatus Say. O.
10507. fusiformis Casey. O. M.
7210 Chilometopon abnorme Horn. B.
7238. Cryptoglossa verrucosa Lec. B.
7243. Centrioptera variolosa Horn. M.
7280. Asida consobrina Horn. O.
7284. marginata Lec. M.
7287. macra Horn. H.
10525. wickhami Horn. B.
..... n. sp. O.
7298. Coniontis ovalis Esch. O.
7316. Eleodes obscura Say. H.
7322. carbonaria Say. O.
7323. obsoleta Say. H.
7324. quadricollis Esch. H.

7325. Eleodes humeralis Lec. H.
7327. extricata Say. O. H.
7329. armata Lec. M. B.
7339. nigrina Lec. H.
..... undet. sp. near nigrina Lec. H.
7351. consobrina Lec. H.
7353. planipennis Lec. H.
7365. Embaphion contusum Lec. H.
7379. Argoporis costipennis Lec. O.
10568. alutacea Casey. M.
7392. Nyctobates subnitens Horn. B.
7394*a*. Iphthimus sublævis Bland. H.
7394*b*. lewisii Horn. H.
7398. Cœlocnemis magna Lec. O. H.
7431. Blapstinus sulcatus Lec. B.
7433. dilatatus Lec. B.
7439. vestitus Lec. M. B.
7440. longulus Lec. M.
7450. Notibius puberulus Lec. B.
10614. Ulus elongatulus Casey. M.
10617. Tribolium confusum Duv. O. H.
..... Platydema n. sp. O.
7568. Helops arizonensis Horn. M.

Family Cistelidæ.

7597. Hymenorus, near confertus Lec. B.
7599. punctatissimus Lec B.
10656. spinifer Horn. M.
10659. ruficollis Champ. M.
10673. indutus Casey. M.

Family Monommidæ.

7644. Hyporhagus opuntiæ Horn. M.

Family Œdemeridæ.

7730. Ditylus obscurus Lec. O.
7739. Oxacis cana Lec. M.
7749. lucana Lec. B.
..... subfusca. B.

Family Mordellidæ.

7771. Anaspis pusio Lec. O.
..... . n. sp. B.
..... undet. sp., probably new. B.
7780. Mordella scutellaris Fab. O.
7863. Mordellistena angusta Lec. O.
..... two undet. sp. B.

Family ANTHICIDÆ.

7919. Notoxus bifasciatus Lec. M.
7922. calcaratus Horn. O.
..... curvitrichus Casey. B.
7948. Anthicus confinus Lec. B.
7968. nanus Lec.? B.

Family MELOIDÆ.

8025. Nemognatha apicalis Lec. O.
8038. punctipennis Lec. B.
8038*b*. punctipennis Lec. O.
8041. cribricollis Lec. B.
8066. Macrobasis lauta Horn. M.
8067. tenella Lec. M.
..... Epicauta, n. sp. B.

Family RHIPIPHORIDÆ.

8178. Rhipiphorus cruentus Germ. O.
8178. cruentus Germ., var. B.
..... Myodites, sp. M. B.

Family OTIORHYNCHIDÆ.

8248. Eupagoderes decipiens Lec. B.
8250. argentatus Lec. B.
8253. varius Lec. B.
8262. Orimodema protracta Horn. O.
8294. Thricolepis inornata Horn. O.
8301. Eucyllus vagans Horn. M. B.
8314. Pandeletejus hilaris Hbst. O.
8317. Cyphus lautus Lec. B.

Family CURCULIONIDÆ.

8398. Apion ventricosum Lec. B.
..... undet. sp. B.
8500. Lixus perforatus Lec. M.
10860. Dinocleus denticollis Casey. M.
8521. Cleonus virgatus Lec. B.
8558. Smicronyx fulvus Lec. O.
8559. sordidus Lec. O.
8571. Endalus limatulus Gyll. B.
8669. Anthonomus canus Lec. B.
11012. ornatulus Dietz. B.
11040. Elleschus angustatus Dietz, var. B.
8701. Sibynes fulvus Lec.? (very dark form). B.
8725. Conotrachelus similis Boh. M.
8835. Cœliodes acephalus Say. O.
11090. Baris dilatata Casey. B.
8886. Pseudobaris farcta Lec O.
8960. Balaninus uniformis Lec. M.

Family Calandridæ.

9014. Yuccaborus frontalis Lec. M.
9026. Cossonus concinnus Boh. O. H.

Family Scolytidæ.

9200. Hylurgops rugipennis Mann. O.

SUMMARY OF SPECIES OF COLEOPTERA.

Cicindelidæ	4	Ptinidæ	3
Carabidæ	54	Lucanidæ	1
Halipldiæ	1	Scarabæidæ	41
Dytiscidæ	7	Spondylidæ	1
Hydrophilidæ	12	Cerambycidæ	21
Silphidæ	4	Chrysomelidæ	45
Staphylinidæ	8	Bruchidæ	4
Phalacridæ	5	Tenebrionidæ	51
Coccinellidæ	20	Cistelidæ	5
Erotylidæ	1	Monommidæ	1
Dermestidæ	6	Œdemeridæ	4
Histeridæ	8	Mordellidæ	7
Nitidulidæ	1	Anthicidæ	5
Trogositidæ	5	Meloidæ	7
Byrrhidæ	1	Rhipiphoridæ	3
Parnidæ	2	Otiorhynchidæ	8
Heteroceridæ	1	Curculionidæ	17
Elateridæ	15	Calandridæ	2
Buprestidæ	33	Scolytidæ	1
Lampyridæ	7		
Malachidæ	17	Total number of species	453
Cleridæ	14		

II. LIST OF LEPIDOPTERA.

The numbers and nomenclature are those of Smith's check-list of 1903.

Abbreviations: O. for Oak Creek Canyon; H. for Humphrey's Peak at base; M. for Martinez (Congress Junction); and B. for Bill Williams Fork.

For valuable aid in the determination of some of the most difficult species, the author is indebted to Professors John B. Smith and C. H. Fernald and Dr. Henry Skinner.

Family Nymphalidæ.

1. Danais plexippus Linn. B.
2*a*. strigosa Bates. B.
10. Euptoieta claudia Cram. B.
15. Argynnis nitocris Edw. O.
20. nausicaä Edw. O.
102. Melitæa perse Edw. M.
113. definita Aaron. M.
117. nympha Edw. H.
127. Phyciodes camillus Edw. O. H.
128. mylitta Edw. O. H.
137. Synchloe lacinia Geyer. M.
143. Grapta satyrus Edw. O.
144. hylas Edw. O.
148. zephyrus Edw. O. H.
153. Vanessa antiopa Linn. H.
154. californica Bdv. H., base and summit.
158. Pyrameis cardui Linn. B.
159. caryæ Hbn. H.
228*e*. Satyrus olympus Edw. O.

Family Erycinidæ.

256. Lemonias mormo Feld. M.
258. cythera Edw. M.
261. palmerii Edw. M.
265. Calephelis australis Edw. B.

Family Lycænidæ.

272. Thecla halesus Cram. B.
283. melinus Hbn. B.
375. Lycæna melissa Edw. O. H.
378. acmon Db. and Hew. B.
383*e*. cinerea Edw. O.
384. amyntula Bdv. O.
387. isola Reak. B.
389. cyna Edw. B.
393. exilis Bdv. B.
394. marina Reak. O. B.

Family Papilionidæ.

406. Pieris occidentalis Reak. H., base and summit.
407. protodice Bd. & Lec. B.
411*a*. Nathalis irene Fitch. B.
423. Catopsilia eubule Linn. B.
433. Colias cæsonia Stoll. O. B.
438. eurytheme Bdv. O. B.
438*a*. ariadne Edw. B.
453. Terias mexicana Bdv. B.
454. nicippe Cram. M. B.
469. Papilio philenor Linn. B.
470. acauda Oberth. B.
473. bairdii Edw. H.
485. daunus Bdv. O.

Family Hesperidæ.

506. Pamphila taxiles Edw. O.
535. phylæus Dru. B.
539. sabuleti Bdv. B.
551. vestris Bdv. O.
590. eufala Edw. near B.
610. Pyrgus ericetorum Bdv. B.
613. tessellata Scudd. O. B.
631. Nisoniades petronius Lint. O.
632. horatius Scudd. & Burg. O.
633. terentius Scudd. O.
638. pacuvius Lint. O.
640. clitus Edw. O.
641. funeralis Scudd & Burg. B.
645. Systasea pulverulenta Feld. M.
654. Pholisora libya Scudd. B.
661. Eudamus pylades Scudd. O.
677. proteus Linn. B.
691. Erycides amyntas Fabr. B.

Family Sphingidæ.

702. Hemaris thetis Bdv. O.
729. Deilephila lineata Fabr. O. H. M. B.
737. Pholus achemon Dru. O.
754. Phlegethontius quinquemaculata Haw. O. M. B.
766. Sphinx chersis Hbn. O.

Family Syntomidæ.

862. Lycomorpha grotei Pack. O.

Family Arctiidæ.

926. Eubaphe ostenta Hy. Edw. O.
999. Lerina incarnata Wlk. O.
1028. Halisidota otho Barnes. O.
1031. Hemihyalea labecula Grt. O.

Family PERICOPIDÆ.

1046*b*. Gnophæla vermiculata G. & R. O.

Family NOCTUIDÆ.

1243. Caradrina meralis Morr. O.
1245. extimia Wlk. O. B.
1247. leucorena Sm. B.
1266. Perigea veterata Sm. O.
1295. Hadena longula Grt. O.
1317. impulsa Gn. O.
1318. devastatrix Brace. O.
1319. exulis Lef. O.
1321. arctica Bdv. O.
1342. auranticolor Grt. O.
1359. indirecta Grt. O.
1382. characta Grt. O.
1444. Pyrophila pyramidoides Linn. O.
1452. Laphygma frugiperda S. & A. B.
1453. flavimaculata Harv. B.
1474. Oncocnemis dayi Grt. O.
1560. Rhynchagrotis placida Grt. O.
1563. alternata Grt. O.
1565. cupidissima Grt. O.
1566. trigona Sm. O.
1626. Agrotis ypsilon Rott. B.
1639*a*. Peridroma saucia Hbn. O.
1647. Noctua smithii Snell. O.
1728. Feltia annexa Tr. B.
1783. Euxoa perfusca Grt. O.
1825. sessile Sm. O.
1831. messoria Har. O.
1888. insulsa Wlk. O.
1900. basalis Grt. O.
1948. Ufeus satyricus Grt. O.
2034. Mamestra noverca Grt. O.
2058*a*. illaudabilis Grt. O.
2080. Barathra occidenta Grt. O.
2099. Xylomiges dolosa Grt. O.
2194. Leucania farcta Grt. O.
..... undet. sp. O.
2231. Tæniocampa incincta Morr. O.
2504. Heliothis armiger Hbn. O. H. B.
2612. Melicleptria villosa Grt. O.
2812. Pleonectyptera finitima Sm. O.
2813. incusalis Grt. B.
2914. Acontia areli Strck. O.
2931. meskei Sm. B.
..... Spragueia urtricina ——. B.
2991. Cissisa ægrotata Hy. Edw. B.
2995. Drasteria crassiuscula Harv. O.
2997. cærulea Grt. O.

3008. Melipotis nigrescens G. & R. B.
3010. perlæta Hy. Edw. B.
3015. jucunda Hbn. B.
3020. Cirrhobolina mexicana Behr. B.
3078. Catocala violenta Hy. Edw. O.
3085. aholibah Strck. O.
3092. mariana Hy. Edw. O.
3099. stretchii Behr. O.
3103. junctura Wlk. O.
3122. subnata Grt. O.
3143. Toxocampa victoria Grt. O.
3191. Heteranassa fraterna Sm. B.
3198. Matigramma rubosuffusa Grt. B.
3202. Yrias clientis Grt. B.
3203. strigalis Sm. B.
3204. volucris Grt. B.
3207. albiciliatus Sm. B.
3235. Erebus odora Linn. B.
3280. Renia near sobrialis Wlk. O.

Family Geometridæ.

3691. Cœnocalpe magnoliata Gn. O.
3707. Emplocia inconstans Geyer. O.

Family Pyromorphidæ.

4461. Triprocris constans Hy. Edw. O.

Family Sesiidæ.

4514. Alcathoe korites Druce. O.
4533. Ægeria tibialis Har. O.
4545. Sesia giliæ Hy. Edw. O.
4577. tecta Hy. Edw. O.

Family Pyralidæ.

4697. Evergestis obliquilis Grt. O.
4726. Loxostege commixtalis Wlk. O.

SUMMARY OF SPECIES OF LEPIDOPTERA.

Nymphalidæ	19	Arctiidæ	4
Erycinidæ	4	Pericopidæ	1
Lycænidæ	10	Noctuidæ	66
Papilionidæ	13	Geometridæ	2
Hesperidæ	18	Pyromorphidæ	1
Sphingidæ	5	Sesiidæ	4
Syntomidæ	1	Pyralidæ	2
		Total number of species	150

III. LIST OF DIPTERA.

For indispensable services in the preparation of this list, the writer is under obligations to his associate and fellow student, Dr. Chas. F. Adams.

Abbreviations for localities: O., for Oak Creek canyon; H., for Humphrey's Peak; M., for Martinez (Congress Junction); and B., for Bill Williams Fork.

Family Mycetophilidæ.

Macrocera diluta Adams, n. sp. (June, 1903). O.

Family Culicidæ.

Culex affinis Adams, n. sp. (June, 1903). O.
apicalis Adams, n. sp. (June, 1903). O.
particeps Adams, n. sp. (June, 1903). O.
tarsalis Coq. B.
triseriatus Say. O.
Anopheles maculipennis Meig. O.
pseudopunctipennis Theobald (?) O. B.

Family Psychodidæ.

Pericoma sp. O.
Sycorax lanceolata Kincaid. O.

Family Tipulidæ.

Erioptera caloptera Say. O.

Family Dixidæ.

Dixa clavata Loew. O.

Family Simuliidæ.

Simulium notatum Adams, n. sp. B.

Family Stratiomyidæ.

Euparyphus albipilosus Adams, n. sp. (June, 1903).
Odontomyia binotata Loew. O. B.
Nemotelus glaber Loew. B.
simplex Will. O.
unicolor Loew. B.

Family Tabanidæ.

Chrysops pachycera Will. B.
Silvius quadrivittatus Say. B.
Tabanus punctifer O. S. B.
vivax O. S. B.

Family Mydasidæ.

Mydas abdominalis Adams, n. sp. M.

Family ASILIDÆ.

Stichopogon trifasciatus Say. O.
Deromyia angustipennis Loew. O. H.
Dasyllis posticata Say. O.
Promachus rufipes Wied. O.
Erax maculatus Macq. B.

Family BOMBYLIIDÆ.

Exoprosopa dodrans O. S. H.
fasciata Macq. O. H.
Dipalta serpentina O. S. H.
Argyramœba simsoni Fabr. O.
Anthrax fulviana Say. H.
lateralis Say. O. H.
sinuosa Wied. O. H.
Phthiria consors O. S. O. H.
sulphurea Loew. O. H.
Geron subauratus Loew. O.
Toxophora pellucida Coq. O.
Dolichomyia gracilis Will. O.

Family THEREVIDÆ.

Psilocephala aldrichii Coq. H.
lateralis Adams, n. sp. B.
occipitalis Adams, n. sp. B.
Thereva anomala Adams. n. sp. O.
diversa Coq. O.

Family SCENOPINIDÆ.

Scenopinus electa Adams, n. sp. B.
mirabilis Adams, n. sp. B.
Pseudotrichia griseola Coq. M.

Family ACROCERIDÆ.

Oncodes melampus Loew. H.

Family EMPIDÆ.

Microdromia empiformis Say. O.

Family DOLICHOPODIDÆ.

Polymedon nimius Ald. O.
two species, probably new. O.
Macellocerus ornatus Ald. O.
Gnamptosilopus infurnatus Ald. O.
Hydrophorus near eldoradensis Wh. O.
Tachytrechus near angustipennis Loew. O.
Pelastoneurus, probably n. sp. B.
Dolichopus sp. O.
myosotus O. S. O.
Asyndetus two sp. B.

Hercostomus near latipes Ald. B.
Lyroneurus sp. B.
Chrysotus, five undet. sp. O. B.
Porhhyrops sp. O.
Paraclius sp. B.
Sympycnus sp. O.
Five species of undet. genus. O. B.
Psilopus melampus Loew. O.
species, probably new. O.

Family Syrphidæ.

Chrysotoxum derivatum Walk. H.
Paragus tibialis Fall. O. B.
Nausigaster geminata Town. M.
punctulata Will. O.
scutellaris Adams, n. sp. M.
Chrysogaster bellula Will. O. B.
Melanostoma stegnum Say. H.
Cataboma pyrastri Linn. H.
Eupeodes volucris O. S. H. B.
Syrphus americanus Wied. H.
arcuatus Fall. H.
creper Snow. H.
lotus Will. H.
ribesii Linn. H.
ruficauda Snow. H.
Mesogramma marginata Say. H. B.
Allograpta obliqua Say. O. H.
Baccha obscuricornis Loew. O.
Myiolepta varipes Loew. H.
Volucella anna Will. O.
esuriens Fabr. O.
haagii Jænn. O.
isabelliana Will. O. B.
Copestylum marginatum Say. O.
Eristalis latifrons Loew. H. M. B.
vinetorum Fabr. B.
Helophilus latifrons Loew. B.
vinetorum Fabr. B.
Xylota fraudulosa Loew. O.
Syritta pipiens Linn. O. B.
Chrysochlamys crœsus. O. S. O.
Spilomyia kahli Snow. O.
Sphyxomorpha snowi Adams, n. sp. B.

Family Conopidæ

Conops gracilis Will. B.
sylvosus Will. O.
xanthopareus Will. O.
Physocephala affinis Will. O.
Oncomyia abbreviata Loew. O.
loraria Loew. O.

Zodion fulvifrons Say. O.
obliquefasciata Macq. O.
parvus Adams, n. sp. (June, 1903). O.
pygmæum Will. O.
scapularis Adams, n. sp. (June, 1903). O.

Family PHORIDÆ.

Phora, probably n. sp., O.

Family ŒSTRIDÆ.

Cuterebra americana Fabr. O.

Family TACHINIDÆ.

Cistogaster immaculata Macq. O.
Gymnosoma fuliginosa Desv. O.
Phorantha occidentis Walk. B.
Wahlbergia arcuata Say. O.
Plagiprospherysa parvipalpis v. d. W. O.
Paraphyto opaca Coq. O.
Chætogædia crebra v. d. W. O.
Epigrimyia lucens Town. O.
occidentalis Coq. O.
Heteropterina nasoni Coq. O.
Pachyophthalmus floridensis Town. O.
signatus Meig. O.
Vanderwulpia atrophopodoides Town. B.
Cenosoma signifera, v. d. W. B.
Metachæta helymus Walk. B.
Hilarella decens Town. M.
Senotainia rubriventris Macq. O. H.
Exorista pyste Walk. O.
undet. sp.
Leucostoma atra Town. O.
Siphona geniculata De G. O. H.
Panzeria radicum Fall. O. H.
Microphthalma disjuncta Wied. O. H.
Gonia capitata De G. O.
undet. sp.
Peleteria robusta Wied. O. H.
tessellata Fabr. O. H.
Archytas analis Fabr. O.
hystrix Fabr. O.
lateralis Macq. O.
Echinomyia algens Wied. O. H.
dispar v. d. W. O.
Epalpus bicolor Will. H.
Hystricia soror Will. O.
Dejeania corpulenta Wied. O.
Paradejeania rutilioides Jænn. O.
Jurinella ambigua Macq. O. H.

Family SARCOPHAGIDÆ.

Phrissopoda præceps Wied. O.

Family MUSCIDÆ.

Musca domestica Linn. O. H. M. B.
Compsomyia macellaria Fabr. O. H.

Family ANTHOMYIDÆ.

Limnophora, two undet. sp. O. B.
Lispa sp. B.

Family SCIOMYZIDÆ.

Tetanocera pictipes Loew. O.
saratogensis Fitch. O.

Family SCATOPHAGIDÆ.

Scatophaga ? sp. ? O.

Family TRYPETIDÆ.

Stenopa vulnerata Loew. O.
Spilographa flavonotata Macq. O.
Plagiotoma obliqua Say. B.
Eutreta sparsa Loew. O.
Icterica fasciata Adams, n. sp. B.
Ensina humilis Loew. B.
Tephritis finalis Loew. O.
fucata Fabr. B.
Euaresta bella Loew. B.
bellula Snow. B.
Urellia abstersa Loew. B.
bisetosa Coq. B.
conjuncta Adams, n. sp. B.
flava Adams. n. sp. B.
mevarna Walk. B.
nigricornis Coq. B.
vicina v. d. W. B.

Family ORTALIDÆ.

Anacampta latiuscula Loew. B.
Stictocephala cribellum Loew. B.
Chaetopsis ænea Wied. B.
Euxesta spoliata Will. B.

Family SAPROMYZIDÆ.

Pachycerina verticalis Loew. O.
Sapromyza sp. O.

Family SEPSIDÆ.

Sepsis violacea Meig. O. H.

Family Ephydridæ.

Paralimna appendiculata Loew. O.
Parydra quadrituberculata Loew. O.
Brachydeutra argentata. Walk. O.
Ochthora mantis DeG. O.
Notiphila sp. B.

Family Agromyzidæ.

Cacoxenus sp. O.
Agromyza sp. B.

Family Oscinidæ.

Chrolops assimilis Macq. O.
pullipes Coq. O.
halteralis Adams, n. sp. (June '03.) O.
Elachiptera bilineata Adams, n. sp. O.

SUMMARY OF SPECIES OF DIPTERA.

Mycetophilidæ	1	Conopidæ	11
Culicidæ	7	Phoridæ	1
Psychodidæ	2	Œstridæ	1
Tipulidæ	1	Tachinidæ	36
Dixidæ	1	Sarcophagidæ	1
Simuliidæ	1	Muscidæ	1
Stratiomyidæ	5	Anthomyidæ	3
Tabanidæ	4	Sciomyzidæ	2
Mydasidæ	1	Scatophagidæ	1
Asilidæ	5	Trypetidæ	17
Bombyliidæ	12	Ortalidæ	4
Therevidæ	5	Sapromyzidæ	2
Scenopinidæ	3	Sepsidæ	1
Acroceridæ	1	Ephydridæ	5
Empidæ	1	Oscinidæ	4
Dolichopodidæ	29	Total species	201
Syrphidæ	32		

IV. LIST OF HEMIPTERA.

For valuable assistance in the determination of the species in this list, the author is chiefly indebted to E. P. Van Duzee. His grateful acknowledgments are also due to Otto Heidemann and Prof. E. D. Ball.

I. Sub-order *HETEROPTERA*.

Numbers from Uhler's check-list. Abbreviations for localities: O. for Oak Creek canon; H. for Humphrey's Peak at base; B. for Bill Williams Fork; M. for Martinez (Congress Junction).

Family Cydnidæ.

75. Cyrtomenus mirabilis Perty. O.

Family Pentatomidæ.

168. Podisus crocatus Uhl. H.
192. Brochymena obscura H. S. M.
223. Cosmopepla carnifex Fab. O.
247. Euschistus servus Say. O.
284. Pentatoma sayi Stal. B.
300. Thyanta custator Fab. M. B.
314. Murgantia histrionica Hahn. O. Also at Ash Fork.
336. Nezara hilaris Say. O.

Family Coreidæ.

446. Mozena lineolata H. Schf. M. B.
447. (near) lunata Burm. O. B.
461. Archimerus calcarator Fab. O.
501. Narnia pallidicornis Stal. M.
507. Chelinidea vittigera Uhl. B.
517. Catorhintha selector Stal. B.
564. Alydus eurinus Say. O.
566. Megalonotus 5-spinosus Say. O.
587. Harmostes reflexulus Stal. B.
595. Corizus hyalinus Fab. B.
599. bohemani Sign. O.
601. lateralis Say. B.
606. Leptocoris trivittatus Say. O.

Family Berytidæ.

582. Jalysus spinosus Say. B.
583. Pronotacantha annulata Uhler. B.

Family Lygæidæ.

..... Nysius minutus Uhl. O.
618. californicus Stal. O. H. B.
639. Geocoris pallens Stal. O.

678. Ozophora picturata Uhl. O.
..... Scalopostethus thomsoni Reut. O.
..... Ptochiomera, n. sp. O.
743. Lygæus bicolor H. Schf. B.
752. reclivatus Say. O. M.
753. turcicus Fab. M. B.
..... melanopleurus Uhl. O.
..... var. brachypterus Uhl. O.
759. Oncopeltus fasciatus Dal. B.

Family LARGIDÆ.

765. Largus cinctus H. Schf. O.
766. succinctus Linn. O. B.
773. Arhaphe carolina H. Schf. O.

Family CAPSIDÆ.

..... Resthenia sp. O.
881. Lygus pratensis Linn. O. B.
902. Pœciloscytus basalis Reut. B.
..... Halticotoma valida Uhl. Ms. O.
..... Coquillettia insignis Uhler. O.
989. Macrocoleus coagulatus Uhl. H.
..... Psallus sp. O.

Family PHYMATIDÆ.

1118. Phymata fasciata Gray. O. B.

Family NABIDÆ.

1133. Pagasa nitida Stal. B.
1144. Coriscus ferus Linn. O. B.
1147. punctipes Reut. B.

Family REDUVIIDÆ.

1152. Sinea diadema Fab. O. B.
1156. defecta Stal. O.
..... rileyi Montd. M.
1172. Atrachelus cinereus Fab. B.
1187. Milyas zebra Stal. O. H.
1209. Pindus socius Uhl. M. B.
1214. Apiomerus crassipes Fab. O.

Family LIMNOBATIDÆ.

1300. Limnobates lineata Say. B.

Family HYDROBATIDÆ.

1302. Hygrotrechus remigis Say. H.

Family VELIIDÆ.

..... Rhagovelia sp.? H. B.

Family SALDIDÆ.

1337. Salda polita Uhler. B.

Family GALGULIDÆ.

1356. Pelogonus americanus Uhler. B.
1357. Gelastocoris oculatus Fabr. O. H. M. B.

Family NAUCORIDÆ.

1365. Ambrysus melanopterus Stal. B.

Family BELOSTOMATIDÆ.

1373. Zaitha anurus H. Schf. H. B.

Family CORISIDÆ.

..... Corisa undet. sp. B.

II. SUB-ORDER *HOMOPTERA*.

Abbreviations for localities: O., for Oak Creek canon; H. for Humphrey's Peak; B. for Bill Williams Fork; M. for Martinez.

Family CICADIDÆ.

Cicada transversa Walk. M. B.
vitripennis Say. B.

Family MEMBRACIDÆ.

Ceresa taurina Fitch. O.
concinna Fowl. ? B.
Stictocephala inermis Fab. O.
rubrovitta Walk. O. B.
Telamona undet. sp. O.

Family FULGORIDÆ.

Scolops uhleri Ball. O.
Œcleus snowi Ball, n. sp. B.

Family CERCOPIDÆ.

Aphrophora irrorata Ball. O.
Philaronia bilineata Say. O.
abjecta Uhler. O.
Clastoptera xanthocephala Germ. O. H.

Family TETTIGONIDÆ.

Oncometopia costalis Fabr. O.
Homalodisca liturata Ball. B.
Tettigonia atropunctata Sign. O.
Diedrocephala mollipes Say. B.
Helochara communis Fitch. O.
Gypona melanota Spaugb. O.

Family Jassidæ.

Phlepsius spatulatus Van Duzee. B.
Jassus clitorius Say. O.
Thamnotettix belli Uhler. O.

Family Psyllidæ.

Livia vernalis Fitch.
Aphalara, sp.
Psyllid, new species and probably new genus.

SUMMARY OF SPECIES OF HEMIPTERA.

Suborder Heteroptera.		Suborder Homoptera.	
Cydnidæ	1	Cicadidæ	2
Pentatomidæ	8	Membracidæ	5
Coreidæ	13	Fulgoridæ	2
Berytidæ	2	Cercopidæ	4
Lygæidæ	12	Tettigonidæ	6
Largidæ	3	Jassidæ	3
Capsidæ	7	Psyllidæ	3
Phymatidæ	1	Total number of species	91
Nabidæ	3		
Reduvidæ	7		
Limnobatidæ	1		
Hydrobatidæ	1		
Veliidæ	1		
Saldidæ	1		
Galgulidæ	2		
Naucoridæ	1		
Belostomatidæ	1		
Corisidæ	1		